

INSIGHTS INTO EXTINGUISHMENT MECHANISMS FROM HEAT EXTRACTION EXPERIMENTS

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From a phenomenological point of view, a flame can be characterized **as** having an activation energy, and inhibition results from any process that reduces the number of radicals with energy in excess of the activation energy barrier. In **this** context, ~~three~~ distinctly different **types** of behavior have been observed in experiments in which the heat extracted by the burner in premixed, flat-flame experiments is taken **as** a measure of degree of inhibition: (1) thermal inhibition of the flame, (2) shifting of the stoichiometry toward the upper inflammability limit, and (3) catalytic recombination of flame radicals. The effect of catalytic recombination of flame radicals is complicated by the fact that **this** process returns heat to the flame. Examples of each **type** of behavior will be presented, the implications of the catalytic recombination mechanism will be discussed, and inferences will be drawn regarding the relative importance of the thermal and catalytic quenching mechanisms. Results will be presented both for a variety of "conventional" inhibiting agents, and for ~~iron-containing~~ compounds.